

Environmental Science Doctoral Study Program

No : 01
Full name : Jossi Erwindy
Student Number : 250130180007
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 08-07-2022
Thesis Title : INTEGRATION OF EARTHQUAKE HAZARD REDUCTION
FOR PALU CITY SPATIAL PLANNING

Thesis Abstract (English) :

Assessment of hazard and disaster risk it is critical to urban resilience. Given that earthquake hazard assessments often have limitations and uncertainty, it is essential to understand the worst-case hazard possibility. Palu City is located in a disaster-prone area because it is traversed by the active Palu-Koro fault. On the other hand, Palu City is one of the national urban areas designed with a national spatial plan as a center for import-export activities or a gateway to international areas and a center for industrial activities. The rapid development in Palu City has led to very dynamic land use changes, especially the increasing need for urban development that is not in accordance with its designation. Due to the physical limitations of the environment and the relatively large and repeated threat of earthquakes, Palu City requires urban spatial planning by considering mitigation aspects, in the form of an earthquake risk reduction study which includes earthquake hazard analysis with seismic microzonation, vulnerability, risk, assessment of the carrying capacity of the city and the integration of disaster risk into urban spatial planning documents. This research uses a method that is applied with quantitative and qualitative approaches, and the data is processed using ArcGIS tools; field observations are supported by primary and secondary data. The results show that 78.18% of the Palu area is under moderate to high earthquake threat because it is in an active tectonic area. In terms of the carrying capacity of the city, most of the land capacity for the development of Palu City is in ability classes A and B (55.43%) which implies that Palu City has urban physical constraints in its city development. However, if it is integrated with the spatial planning of Palu City until 2030, most of it (78.79%) is in accordance with the carrying capacity of the land, especially in protected areas, but there are still uses of space that are not in accordance with its carrying capacity, namely 21.21% mainly located in cultivation areas with high earthquake risk, which are generally located in the city center with high activity loads, high growth rates, large enough built up land, and dominated by residential activities, trade and services, government, and other city economic support activities. The findings of the earthquake hazard risk reduction study can then be integrated into a city spatial planning document which is used as the basis for making a community development plan document for the Palu City Government, known as the Palu City Spatial Plan. Thus, strict urban spatial planning implementation as means for disaster mitigation is urgently needed.

No : 02
Full name : Diana Susyari Mardijanti

Student Number : 250130160001
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 14-02-2022
Thesis Title : THE UTILIZATION OF THE COCOPITH POWDER AS A
BIOCOMPOSITE INSULATOR IN OPTIMIZING THE
ECONOMIC VALUE OF WASTE IN THE LOCAL WASTE AREA

Thesis Abstract (English) :

The coconut coir milling industry produces coconut fiber and waste in the form of coconut coir powder (cocopith) with a ratio of 1: 3. More cocopith production than its main production raises environmental problems that will never be completed as the industry continues to produce to meet market demand. The growing accumulation of cocopiths both in area and height will cause air and water pollution, and reduce productive land. Efforts made to reduce the pile by combustion have not been effective, cocopith processing is needed based on its biological and chemical properties with environmentally friendly technology. The utilization of cocopith into biocomposite insulators is one solution and can increase the economic value of cocopith as waste. Through air quality tests obtained the results that the emission gas from burning cocopith is Sulfur Dioxide (SO₂), which is as much as 669 mg / Nm³ while the SO₂ quality standard is 600 mg / Nm³. Air polluted by Sulfur Dioxide (SO₂) compounds causes humans to experience disruptions in the respiratory system. Ambient air quality at the milling site is still good. Ambient air quality at the milling site is still good. Cocopith is not significant against environmental disturbances, especially TSP parameters. The dust test result (TSP) of cocopith of 85.8 µg/Nm³ is below its quality standard of 230 µg/Nm³. The size of the cocopith is 100- 300 microns, in the form of light dust so that it is easily inhaled and interferes with breathing. Through water quality tests obtained the results that cocopith contaminated the water source around the coconut coir milling site. Lindi produced from cocopith deposits in the environment (open dumping) has an actual pollution load that is higher than the maximum pollution load for COD and BOD. The ability of cocopiths to be processed into biocomposites is affected by the levels of lignin cocopith (22.7%) more than the cellulose content (10.27%). Mycelium-based biocomposites are produced by growing mycelium on natural fibers that are lignocellulose wastes such as wood powder, straw and cocopith. The method of gluing cocopith as a mycelium-based natural fiber can be done with a cocopith composition of 50%, wood powder 27% and pollard 23%. The C/N ratio of 68.99 provides the best results with a mycelium growth of 87.7% thus forming a strong and solid structure into a biodegradable composite. The properties of cellulose and lignin may explain the characteristics of cocopith that are difficult to decompose and the thermoplastic properties of lignin that can be analogous to resin properties that have the ability to insulate properly. The content of the most chemical compounds in cocopith that has the potential to provide insulation properties is chlorida. Based on these heat-storing characteristics and abilities, cocopiths are processed into mycelium-based biocomposites that serve as thermal insulators. The physical properties of biocomposites, namely maximum stress and tensile stress, have been measured through press tests and tensile tests in the laboratory (flexural strength test with ASTM-D7264 method). The feasibility of biocomposites as insulators through the thermal

conductivity test of biocomposites at temperatures (13-40) °C has a thermal conductivity value of 0.089 ± 0.003 W/mK. The thermal conductivity value is in the range of 0.01–1.00 W/mK as a recommendation of the thermal conductivity value of the insulator. Utilization of cocopith biocomposites into insulators is highly recommended both economically with Break Even Point (BEP) analysis and its feasibility as an environmentally friendly insulator.

No : 03
Full name : Toni Samiaji
Student Number : 250130150001
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 07-03-2022
Thesis Title : SCENARIO OF SULFUR CONTENT REDUCTION ON COAL
IN THE ORDER TO FULFILL THE QUALITY STANDARDS OF
SO₂ CONCENTRATION IN THE PROVINCE OF DKI JAKARTA

Thesis Abstract (English) :

The concentration of SO₂ (sulfur dioxide) in the air that has passed the quality standard can cause public health problems. SO₂ gas when it is dissolved in rainwater can form acid rain. Acid rain is bad for the environment. Based on data from the BMKG (Meteorology Climatology and Geophysics Council), the concentration of SO₂ in Jakarta from 1983 to 2020 fluctuated and in 2009 there were data that had passed the quality standard. The purpose of this study was to analyze total SO₂ emissions, analyze the decrease in SO₂ emissions around the highway after the presence of electric motorized vehicles, create multiple scenarios and analyze the sulfur content in coal every year so that the SO₂ concentration in Jakarta is below the quality standard. The approach used is from several environmental problems that exist in Jakarta, sought and compiled theories (results of past research) that are relevant to these problems, then made novelties as the basis for making research problems. Next is to make research objectives and methods related to the research problem. To answer the research problem, a proposition is made. The data used are Gross Regional Domestic Product, population, household waste production, fuel consumption and number of motorized vehicles in Jakarta. In addition, the Gross Domestic Product, population, national fuel consumption, SO₂ gas emission coefficient, production of certain goods. The calculation of SO₂ gas emissions is carried out from 3 sources: 1. fuel consumption, 2. household waste burning, 3. industrial processes. Next, create multiple scenarios that will reduce SO₂ emissions every year from fuel consumption and a quality standard scenario to determine the sulfur content in coal to suppress SO₂ concentrations so that they are always below the quality standard in the 2022-2038 period. The findings (results) of this study are that the cause of SO₂ emissions from anthropogenic activities in Jakarta to increase from 1970 to 2020 is because fuel consumption and industrial production (other than crude oil) increase, reducing the sulfur content in coal is more effective than handling exhaust gas in lowering the concentration of SO₂. The conclusions of this study are as follows. The trend of SO₂ emissions from anthropogenic activities in Jakarta from 1970-2020 is increasing non-linearly. As a result of the use of 1,725 electric motorized vehicles from 2019 to 11,969,837 units in 2050, this resulted in a reduction of SO₂

emissions on roads in Jakarta from 0 to 33%. Based on multi-scenario analysis, it is found that in 2021-2050 the coal scenario is the scenario with the greatest reduction in SO₂ emissions in Jakarta. The results of the analysis of the quality standard scenario show that by reducing the sulfur content in coal every year, the concentration of SO₂ in Jakarta from 2022-2038 can meet the ambient air quality standards.

No : 04
Full name : Dita Agustian
Student Number : 250130150004
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 26-01-2022
Thesis Title : SUSTAINABILITY ANALYSIS OF FISHERIES MANAGEMENT THROUGH EAFM APPROACH (CASE STUDY AT PALABUHANRATU NUSANTARA FISHING PORT SUKABUMI DISTRICT OF WEST JAVA)

Thesis Abstract (English) :

This study aims to analyze the sustainability status of fishery management at Palabuhanratu Archipelago Fishing Port using the Ecosystem Approach to Fisheries Management (EAFM), strategies for strengthening fisheries management, the level of fulfillment of community economic needs from fishery products, and the feasibility of upgrading the status of the port to an Ocean Fishing Port. The method used is a survey using composite analysis, gap analysis, descriptive analysis, and technical and economic feasibility analysis using the ROI, NPV, PBP, and BEP methods. The results show that fisheries management in Palabuhanratu Archipelago Fishing Port is good in supporting sustainable fisheries management. Some strategies for strengthening fisheries management are making regulations on limiting fishing efforts and the minimum size of fish that can be caught; socializing and educating the principles of sustainable fisheries management; enforcing the law and providing strict sanctions indiscriminately; providing access to capital with guarantees and an easy and profitable process; and increase the quantity and quality of the fish processing industry. Then the level of meeting the economic needs of the community from fishery products on average is still higher than the regional minimum wage, but the distribution is uneven. Furthermore, regarding the plan to increase Palabuhanratu Archipelago Fishing Port to become an Ocean Fishing Port, the results of the EAFM assessment can be used to assess the feasibility of upgrading the status of a fishing port and the results are eligible with conditions, including providing opportunities and more portions for the local community to work and entrepreneurship as fishermen, entrepreneurs, employees, and port officer; resolve land acquisition conflicts for port and dock expansion by optimizing the role of existing stakeholders; and providing adequate facilities and infrastructure such as land/special industrial areas within the port.

No : 05
Full name : Asep Zainal Mutaqin
Student Number : 250130170003
Study Program : Environmental Science Doctoral Study Program

Graduation Year : 25-10-2021
Thesis Title : ETHNOECOLOGY STUDY OF SUWEG
(AMORPHOPHALLUS PAEONIIFOLIUS (DENNST.)
NICOLSON) IN THE RURAL AREAS OF THE CIMANUK AND
CITANDUY WATERSHED

Thesis Abstract (English) :

Suweg (*Amorphopallus paeoniifolius* (Dennst.) Nicolson) is a plant species that is widely distributed in Indonesia, including in the rural areas of the Cimanuk and Citanduy watersheds. The distribution and population is very diverse, influenced by the behavior of the resident and the ecological environment in which it grows. This study aims to examine the ethnoecology of suweg which is supported by ecological scientific facts, so that it is integrative. Ethnoecological data were collected purposively through interviews with residents who were considered to have knowledge competence about suweg. Data were analyzed through emic and ethical approaches by means of cross-checking, summarizing, and synthesizing. Ecological data were collected by observing the suweg population; land type and elevation; soil pH and moisture; air temperature, humidity, and pressure; light intensity; as well as the species of plants that grow around the suweg, which were then analyzed descriptively. Suweg population was also analyzed by calculating the Summed Dominant Ratio (SDR) and Important Value Index (IVI). The results showed that the resident had knowledge about the morphology, folk classification, habitat, utilization, and cultivation of suweg which in several ways was in line with observations, especially related to the ecological environment, namely land conditions, elevation, temperature, soil types, and surrounding plants; suweg is generally found in homegardens, gardens, rice fields, and pond edges with diverse populations and growing environments; SDR and INP values of suweg in each land type are on average higher than other species; and suweg has the potential to be developed based on the fact that it is used by the population and diverse growing environments, so that it is possible to increase the socio-economic welfare of the resident and maintain the physical condition of the watershed due to land cover with the cultivation of suweg in an agroforestry system.

No : 06
Full name : Muhlisin
Student Number : 250130160002
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 04-02-2022
Thesis Title : COLLABORATIVE GOVERNANCE DEVELOPMENT IN
MANAGEMENT OF GREEN SPACES IN CILEGON CITY

Thesis Abstract (English) :

The role of green open space (GOS) is very important in improving the urban environment. However, the development of GOS in urban areas in Indonesia has not been optimal. The management of GOS so far seems to run separately between the government and other stakeholders. To realize GOS requires the synergy of all

stakeholders, realizing GOS requires a partnership between the government and business entities. Collaborative governance research in the management of GOS is carried out, but generally they only take pictures of the ongoing collaborations and analyze them using one of the collaborative models. In contrast to previous research, this research identifies the potential for implementing collaborative governance based on the components that influence it, then the potential for existing collaboration becomes the basis for building a collaborative model of GOS management that has not yet occurred. This dissertation is the result of research conducted from October 2019 to October 2020 in of Cilegon City. The research method used is a mixed method, quantitative and qualitative. Data was collected through field observations and purposive interviews with informants. The data collected consists of: aspects of the condition, diversity and structure, the need, management, and the potential for collaborative GOS management. The results show that the Cilegon City Government manages public GOS in the form of city parks, sub-district parks, road median parks, road island parks, and urban forests. The condition of public GOS does not meet the 20% area of the city area, the area of each GOS does not meet the requirements, the distribution in each sub-district is not evenly distributed, vegetation cover and diversity is still low, and not all types of GOS are managed properly. In addition, the City of Cilegon does not yet have a master plan and regional regulations regarding the management of GOS, so that its management has not been in synergy between one regional government organization and another, and the management of GOS does not cover all types of GOS, both public and private. Therefore, revitalizing the management of GOS in Cilegon City through governance that involves stakeholders needs to be carried out for the best solution. Overall, the potential components of collaborative governance include initial conditions, facilitative leadership, institutional design, magnetic attracor, shared vision. and the lightweight agreement and government was found among all stakeholders in the high category. This component has a very important role in supporting the success of collaborative governance of GOS. The model is based on collaborative governance in the management of GOS in Cilegon City which is built on the Ansell & Gash (2008) and Surman & Surman (2008) models. Collaborative governance of GOS management consists of four components: initial conditions, facilitative leadership, institutional design, and the main components of the collaboration process. These four components are the basic model of Ansell & Gash (2008). Business entities that have the wilingness to collaborate have an important role in supporting the initial conditions for collaboration; City Government as a mediator and local leadership plays an important role as facilitative leadership; and CSR forums that are inclusive and transparent play a role in initiating institutional design. These three components play a role in supporting the collaborative management process of GOS management. The magnetic attractor, shared vision, and lightweight agreements and governance, which are the three components of the Surman & Surman Constellation Model (2008), trigger the formation of coordination of the overall GOS management stewardship committee and an action team formed based on the issue of GOS management and small and scattered areas.

No : 07

Full name : Mohamad Satori

Student Number : 250130130002
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 17-07-2018
Thesis Title : DYNAMIC SYSTEM MODEL OF INTEGRATED WASTE
MANAGEMENT CASE STUDY: BANDUNG CITY

Thesis Abstract (English) :

Solid waste management (SWM) in various cities around the world is still a serious and complex problem. Currently, SWM causes problems not only in an environmental context but also in social and economic contexts. Therefore, integrated waste management (IWM) is an option that needs to be explored in municipal SWM. In this regard, it is necessary to develop models of an IWM system to integrate the formal system (government) with non-formal systems (informal sector/IS and community-based activity). To integrate all actors needed 16 factors that influence of IWM. After the modeling of the 16 factors quantified into important variables affecting the IWM consisting of: uncontrolled inputs (population, community lifestyle, waste generation, recycling waste prices; controlled inputs (socialization budget, handling budget, reduction budget, accessibility the IS of SWM; output desired (reduction in sources, processing performance, informal sector revenue, managed waste), and unintended output (collection load, mix waste, discarded waste, unmanaged waste). Based on the simulation result using dynamic modeling, the recommended scenario is optimistic scenario, where the reduction of waste in the source is 16%, the reduction of the regional scale is 21%, the net income of the scavenger is Rp 2.405.278 / person / month, overall reduction performance 39%, handling performance 61%, and cost savings of Rp 26.2 billion / year.

No : 08
Full name : Kamalia Purbani
Student Number : 250130120009
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 14-08-2017
Thesis Title : IMPLEMENTATION OF COLLABORATIVE GOVERNANCE
IN SUSTAINABLE URBAN MANAGEMENT (Case Study of
Collaborative Planning of City Park Management in
Bandung)

Thesis Abstract (English) :

This dissertation is the result of the author's research on "Implementation of Collaborative governance in Sustainable Urban Management: Collaborative Case Study of Park Management in Bandung City)". The problems faced by today's urban areas are getting more complex, thus the proper governance is needed in order to establish the sustainable cities. Green space is one of the indicators of sustainable and liveable city. Collaborative governance is considered as the appropriate strategy to deal with complex issues. The Bandung city since 2013 has launched a collaborative approach in urban development which also covers park management. In this research, the implementation of Collaborative governance in the city park management are examined using six main elements. The method used in this research is qualitative method. The key informan are

determined by purposive sampling technique. The data obtained through in-depth interviews, literature studies and documentation. Data were analyzed by using three stages consisting of data condensation, data presentation and withdrawal conclusions. The results showed that the implementation of Collaborative governance in urban park management in Bandung is still not optimal. Based on theory, the government's collaborative leadership is the central point of successful implementation of collaborative governance. With an active role of government as a facilitator, inclusive stakeholder engagement will come into being. For the case of Bandung City, it shows that the collaborative leadership of the government that has not been optimal still can encourage the involvement of stakeholders although not yet inclusive. The concept of collaborative governance derived from Western countries is not necessarily applicable to all regions. The first pre-requisite element is the government-owned collaborative leadership, followed by mapping the initial conditions of the institutional design owned, which will affect the capacity of stakeholders and the ability of the government to become facilitators, which in turn will create inclusive stakeholder involvement which is the core of collaborative governance. The supporting factors that contribute to the implementation of Collaborative governance in Park Management are (1) The existence of forums that bridge the stakeholders (2) the implementation of open government (3) Potential of Collaboration with Private (4) Institutional capacity building by the community through independent mechanism (5) (6) Initiation of city park management by the government (7) The existence of voluntary organizations and community-based institutions as a driving force (8) Regulations that encourage the involvement of stakeholders in an optimal manner. The inhibiting factors that contribute to the implementation of Collaborative governance in Park Management are (1) Lack of access for the general public to be involved in urban park development planning process (2) Institutional capacity of government in green space management budgeting (3) The principles of collaborative leadership is not fully understood by stakeholders (4) Limitation of government role as facilitator in collaborative process (5) The Absence of adequate institutions and programs to support education and training (6) Lack of regulation of cooperation with private for non profit park management. Recommendation given to the Municipal Governments are: (1) Initiation of collaborative park management processes should be further encouraged to be undertaken by the Head of the Technical Service Office dealing with landscapes, the Environment and Community Empowerment (2) instituting simple collaborative governance guidelines on various fields so that each stakeholder will Involved can obtain more transparent information and incentives that can be provided (3) enhancing its role to promote stakeholder capacity by providing systematically and comprehensively education and training for each stakeholder in order to develop the competence of building consensus, understanding of the environmental aspects being managed and a regular forum for social learning. (4) formulating regulations that encourage private parties to collaborate on socially managing the park in the long term with non-commercial compensation and apply the concept of green budgeting by using medium term budgeting framework in order to realize sustainability in programs and activities for Increase the quantity and quality of green open space according to regulation.

No : 09
Full name : Gemilang Lara Utama
Student Number : 250130120002
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 19-07-2016
Thesis Title : ANALYSIS OF THE UTILIZATION OF INDIGENOUS YEASTS
CONSORTIUM IN BIOCONVERSION CHEESE WHEY AND
VEGETABLE WASTES INTO BIOETHANOL AND SOCIAL
ECONOMIC AND ENVIRONMENTAL BENEFITS

Thesis Abstract (English) :

The utilization of indigenous yeasts consortium on bioconversions of cheese whey and vegetable wastes into bioethanol aimed to generate social economic and environmental benefits. The research done in three stages, the first stage was laboratory research to characterized chemical and microbiological potential of cheese whey and vegetable wastes, the second stage was the optimization of the cheese whey utilization up to semi-pilot scale and the third stage was survey of public perception and economic calculations based on the results of semi-pilot. Characterization on the first stage includes materials proximate analysis, identification and isolation of potential indigenous yeasts in producing highest bioethanol contents. Optimization on the second stage including the formulation of raw material variations and consortium of potential indigenous yeasts with completely randomized design factorial pattern 3X3 in producing highest bioethanol contents and lowest gas production of treatments combination as basis for semi-pilot scale test. Semi pilot testing performed in treatments combination of temperature and the addition of molasses to determine the optimal conditions in producing the highest bioethanol contents. Analysis of C, N, P, K of distillery wastes done to determine its quality as liquid organic fertilizer. Analysis of BOD, COD and CO₂ emissions potential calculated to determine the environmental benefits. The best treatment in semi pilot test used as basis for the calculation of the joint costs allocation to determine the break-even point and the adjustment of the cost of goods sold from the main product. Public perception survey conducted to determine the social benefits of the utilization. Results showed that the consortium of potential indigenous yeasts was non significant in increased the bioethanol contents, meanwhile the combination of vegetable wastes increased the bioethanol contents significantly. Indigenous yeasts consortium of *C.lambica* and *P.zopfii* on bioconversions cheese whey and of napa cabbage (1:1) produced bioethanol contents of 1.51% in laboratory scale and 11.06% bioethanol contents in semi-pilot scale. The distillery wastes contained C (12.83%), N (0.56%), P (0.83%) and K (0.35%). Utilization of indigenous yeasts consortium of *C.lambica* and *P.zopfii* on bioconversions of cheese whey and napa cabbage for bioethanol produces social, economic and environmental benefits. Social benefits including appearance of community engagement which resulted from support, trust and participation potential from the community to KPBS. Economically the utilization could save waste disposal costs, gave financial benefit of Rp67.916.000,-/month, decrease 13.12% the cost of primary product as well as the Break Even Point can be reached less than 4 months. The environmental benefits resulting reduction of pollution load of 41.8-

49.1%, 33.33% reduction of BOD and 13.65% reduction of CO₂ emissions potential that equivalent to 422,219.67 kgCO₂eq per year.

No : 10
Full name : Helmi Gunawan
Student Number : 250130120008
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 10-10-2019
Thesis Title : CLIMATE CHANGE MITIGATION IN THE TRANSPORT
SECTOR AND SELECTED CO-BENEFITS IN BANDUNG CITY,
INDONESIA

Thesis Abstract (English) :

Climate policy has a strong influence on policy processes at the national level in Indonesia. Meanwhile, other policies that focus on air quality improvement are also being implemented at local levels. Indonesia has committed to reducing greenhouse gas (GHG) emissions by 29 percent by 2030. This calls into question the extent to which cities and local governments can cope with the challenges of the current transport sector climate change mitigation programmes. Bandung City is one example. The main objective of this study is to contribute to the understanding of the role of a multiplicity of actor characteristics and contextual factors in the transport sector climate change mitigation policies and governance in Bandung City. The main research question is: - how do actor characteristics, interaction between actors and contextual factors influence the implementation of climate change mitigation in the transport sectors and contribute to selected co-benefits? And based on this: - how can climate change mitigation policies in the transport sector be improved? The research design employed an empirical case study on governance and policy relevant to climate change efforts to lower GHG emissions in Bandung City. The study evaluated the climate change mitigation programmes and the air quality improvements using the actor-based framework of the Contextual Interaction Theory (CIT). The governance and stakeholder characteristics of climate change mitigation were also analysed with the structural context part of the CIT framework using the Governance Assessment Tool (GAT). A survey of actor's willingness to use different modes of transport and travel behaviour enriched the policy evaluation. The results show that air quality improvement policy has been implemented separately from climate policy. The former operates at the local level and the latter at the national level. The actor interaction analysis concluded that a more holistic environmental policy approach would be more efficient in reducing local air pollution and contributing to the mitigation of climate change. It is also confirmed that the policies to reduce GHG emission do not accord with government edicts. This study found that actors have considered and chosen mitigation programmes given the limits of their knowledge, resources, and power. Several policies encouraging reduced GHG emissions require a multi-actor interaction process. Local actors and the provincial level in Bandung City proposed the Paratransit and Car-Free Day programmes to help reduce transport GHG emission. Other programmes, such as the Trans Metro Bandung (TMB) and vehicle emissions tests, were also expected to reduce GHG emissions. The results of the quality of governance assessment showed that all programmes are supporting

climate change mitigation as stipulated by government. The extent to which this was the case was found to be low to moderate; flexibility as restrictive, and coherence and intensity as moderate. In general, these qualities created a context with some limits. However, several improvements and positive trends were apparent at the local level. The governance assessment of the climate change mitigation programmes as perceived by the actors concluded that problems of differing actor perspectives and goals were faced by all cases, which often complicated the development of the operational programmes. The assessment of co-benefit criteria for three policy instruments found this approach was most relevant to public transport, given the actual condition of the programmes. The TMB as a bus rapid transit met all the criteria of co-benefits. Thus, this programme has had the highest impact in delivering co-benefits. The private sector paratransit system had positive value for the criteria of lowering GHG emissions, energy and environmental sustainability, and achieving development goals. The vehicle emission test met the criteria of sustainability and technical feasibility. The survey of willingness to use alternative transport modes found a positive correlation between the travel mode choice of vehicle users and their perception on how to lower GHG emissions. A negative correlation existed between vehicle users with their perception of GHG emission issues and policies to mitigate climate change. The intention to use a particular mode of transport was, to a large degree, dependent on a vehicle's ownership. The frequency of use of one particular transport mode encouraged this use to become habitual and this determined their willingness to reduce the use of private vehicles or increase the use of public transport. As a result, we believe that the policy to encourage the use of public transport will be hindered by the existing use of private vehicles. In the absence of any policy intervention to reduce private vehicles, the programme to raise awareness, and encourage people to use public transport, will experience many obstacles. Three factors were found to be important for travel mode use, namely: speed, safety, and comfort. Secondary contributory factors affecting public transportation use were low-prices and difficulties faced to own and use private vehicles. The intention to use private vehicles was strongly related to user's needs to access multiple destinations. The policy scenarios represented in this survey covered: increasing taxes, increasing parking prices, and fuel increment as key variables of travel behaviour. However, all respondents accepted that fuel increment would intervene and reduce the use of private vehicles. The results showed that any increase in gasoline prices could encourage use of public vehicles. This policy could reduce gasoline consumption. It would create a national economic benefit by reducing subsidies to society and benefit the environment. The study concludes that, based on the dynamic actors-interaction framework, climate change policies, especially mitigation in the transportation sector in the city of Bandung, several programmes can reduce GHG emissions. However, governance aspects remain limited, although some programmes have improved. These programmes will be unable to succeed in helping to reduce GHG emissions if the behaviour of actors, especially private vehicle users, are not well managed.

No : 11
Full name : Farha Norma Josefin Dapas
Student Number : 250130120007

Study Program : Environmental Science Doctoral Study Program
Graduation Year : 13-09-2017
Thesis Title : ASSESSING THE ECOLOGICAL INTEGRITY OF STREAM
USING FUNCTIONAL FEEDING GROUPS OF AQUATIC
INSECT LARVAE FOR THE MANAGEMENT OF UPPER
TONDANO RIVER, NORTH SULAWESI

Thesis Abstract (English) :

Ecological integrity of the streams are facing pressure of anthropogenic and natural disturbances. Panasen Stream is one of the inlets that contribute to the degradation problems of Lake Tondano. This study aim to examine the ecological integrity of stream based on response of aquatic insect larvae, through its distribution, abundance, biodiversity, and the presence based on functional feeding group composition. Its presence can be a measuring tool as well as an evaluation of the effectiveness of ongoing legislative regulation, so the appropriate conservation strategies can be developed to generate upper Tindano river management policies. The survey of population of aquatic insects with design samples is Stratified Random Sampling in each type of land use, longitudinally from upperstream to Lake Tondano, in wet and dry season. The Surber sampler put purposively on the edge and middle of the river. Collections of perifitone, litter and substrate and measurement of physical and chemical parameters of water such as temperature, velocity, pH, dissolved oxygen, conductivity, turbidity, hardness, total suspended solids, ammonia and total phosphate were carried out simultaneously, also carried out on three references during the period September 2015 to May 2016. The study found 36 types of insectic larvae included in 28 families in 7 unevenly distributed orders. *Petrophila* sp. larvae are found on all parts of the Panasen Stream by sampling representing the dry season. Individual *Cheumatopsyche* sp. found most at the time of the study. The highest diversity index is the reference streams. The functional feeding groups occupying the Panasen Stream were Collector filterers (59%) followed by Collector gatherers (19%), opposite on streams, Collector gatherers (46%) dominated followed by Collector filterers (36%). The Biotic Index indicates that tolerant aquatic insect larvae are found in the Panasen Stream, while those are sensitive to the referral stream. Physico-chemical parameters that influence the presence of aquatic insect larvae are stream depth, flow velocity, substrate, and rainfall. In addition to anthropogenic disturbances, the Panasen Stream is also frequently affected by the eruption of Mount Sopotan. These results indicate that the Panasen Stream is in a heavily disturbed condition so its ecological integrity is low.

No : 12
Full name : Evi Susanti
Student Number : 250130130001
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 30-07-2018
Thesis Title : THE ANALYSIS OF LEAD BIOACCUMULATION IN
AQUATIC FOOD CHAIN BASED ON TEMPERATURE AND
CONCENTRATION IN CIRATA RESERVOIR-WEST JAVA

Thesis Abstract (English) :

The problems of heavy metal pollution combined with the issue of climate warming has become a concern. Global warming affects temperature variations in the atmosphere and waters, affecting weather and availability of water supply in terms of both quantity and quality. The increase of water temperature on freshwater systems could decrease dissolved oxygen levels and increase toxicity of pollutants, including heavy metals. Cirata Reservoir has been polluted by heavy metal of lead (Pb) which is known to be toxic to organisms living in this water because of the potential accumulation in the food chain. This research aims to analyze the bioaccumulation of Pb based on temperature difference and concentration on aquatic food chain in Cirata reservoir. This research was a quantitative research by taking data in the field as well as laboratory experiments. Research conducted in January – December 2017 during dry season, rainy season and transitional months. Three observation sites consist of dense areas of floating net cages (KJA), KJA prohibition areas and reservoir outlets. Environmental quality measurements were performed in situ including the physico-chemical parameters of the water. Samples taken included water samples, periphyton, phytoplankton, zooplankton performed using plankton-net in various sizes. Tilapia (*Oreochromis niloticus*) and common carp (*Cyprinus carpio*) samples were collected from fishermen who caught the fish in all three locations. The results showed that Pb bioaccumulation on the periphyton, phytoplankton, and zooplankton were higher in the dry season. Bioaccumulation of Pb on tilapia is detected in gill, liver and bone organ, whereas in common carp only found in gill organ. The results indicate that Pb transfer occurs only in food chain phytoplankton to zooplankton but not to the higher trophic level with TTF value of 1.586-1.628. An increase in temperatures may increase the Pb bioaccumulation in the food chain components in Cirata Reservoir. In the laboratory studies, increase in temperature will increase on *Chlorella vulgaris* and *Daphnia magna* causes an increase in sorption capacity of Pb by 8-24%.

No : 13
Full name : Suryana
Student Number : 250130130004
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 18-12-2018
Thesis Title : ECOTAXONOMY AND LOCAL KNOWLEDGE AS A
SCIENTIFIC BASE IN SUSTAINABLE TREE FERN
MANAGEMENT POLICY FORMULATION IN WEST JAVA

Thesis Abstract (English) :

Degradation of tree fern species and population in some conservation areas in West Java, is the strongest motivation in this study. Three main studies here are ecotaxonomy, local knowledge of the population, and management of tree fern diversity. The study was carried out at the conservation area of Mount Papandayan and Mount Tangkuban Perahu. The aim of this study is to formulate sustainable management policies for tree ferns. To obtain the required data, mix method is used between quantitative and qualitative data with explanatory sequential strategy. The

results showed that the level of biodiversity of tree ferns, the pattern of group distribution and the success of growing to become adult tree ferns were low. There are 4 types of tree ferns that have been identified, namely *Cyathea contaminans* (Wall ex Hook.) Copel, *Cyathea orientalis* (Kunze) Moore, *Dicksonia blumei* (Kunze) Moore, and *Cyathea latebrosa* (Wall ex Hook.) Copel with *Cyathea latebrosa* (Wall ex Hook.) Copel is the dominant type. Tree ferns are found in two different habitats, which are in good and disturbed natural forest, both of which have the same environmental conditions, namely soil pH tends to be acidic (4.3-6.5), soil moisture (53-75%), light intensity (2,644-13,398 lux), and air temperature (14-19°C). Local communities with a range of 50-59 years with a low level of education (not graduating from elementary school) have the highest knowledge of local species names. The knowledge of the uses of tree ferns are as vegetables, ornamental plants, growing media, and for handicrafts. Some local people recognize traditional conservation, namely the tradition of “*pamali*” or the prohibition to come to the habitat of tree ferns in Sundanese called “*lamping*” (valley) and “*side of wahangan*” (riverbank) in the forest area, mainly to take “*paku tihang*”. Unfortunately, most people do not hold this tradition anymore. This is one of the causes of the exploitation of “*paku tihang*” which is not sustainable, so that there is a decrease in species and population. The utilization of the four types of tree ferns that are still relatively high, is a problem that arises in this region. One way to overcome this is to propose policy points, among others, to determine the four types of tree ferns to be the priority types for conservation, to make collection externally, to create a protection zone for *Dicksonia blumei*, to regulate permits and access and the cultivation of *Cyathea latebrosa* and *C. Contaminans* in community forests.

No : 14
Full name : Dian Akbarini
Student Number : 250130150003
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 17-12-2020
Thesis Title : A COLLABORATIVE MANAGEMENT MODEL OF
PELAWAN FOREST BIODIVERSITY PARK IN CENTRAL
BANGKA DISTRICT

Thesis Abstract (English) :

The Palawan Forest Biodiversity Paek (Taman Kehati), Central Bangka District, is a regional biodiversity park designated as a conservation area outside the forest area with an in-situ concept with an area of 47.04 hectares. The existence of this biodiversity park is prioritized as a means of ecotourism, education and research facilities. However, this function has not been able to run well because management is still not holistic and not collaborative. The purpose of this study was to analyze the potential of natural resources and activities carried out in the Pelawan Forest Biodiversity Park, to analyze the factors that become obstacles to the management of the Biodiversity Park and to build a collaborative management model suitable for the Pelawan Forest Biodiversity Park, Central Bangka District. The research method uses mixed methods qualitative and quantitative approaches. The results showed the potential of natural resources in the form of plants, animals and landscapes to support the sustainability of the Pelawan

Forest Biodiversity Park. The Pelawan Forest Biodiveristy Park plant vegetation is arranged in the kerangas ecosystem, the land swamp ecosystem, the deep swamp ecosystem, the secondary forest and the ecoton. The Pelawan Forest Biodiveristy Park has 165 species of plants from 54 families. This plant is categorized into 14 benefits, namely as a medicinal plant, a source of food, cultivated plants, cover of pepper plants, handicraft materials, ornamental plants, household tools, ropes, traditional toys, dyes, honey pusung, sunggaum building materials and animal feed. The animals found in the Pelawan Forest Biodiveristy Park consist of 5 classes of animals that live terrestrial, namely aves, reptiles, amphibians, insects and mammals as well as 10 animal families that live in rivers. The flora and fauna in the Pelawan Forest Biodiveristy Park are categorized as protected according to the Red List and laws and regulations in Indonesia. The factor that becomes an obstacle in the management of the Pelawan Forest Biodiveristy Park is the management of the management unit caused by communication and coordination factors, insitutional conflicts and boundary conflicts. The suitable collaborative management model for the management of the Pelawan Forest Biodiveristy Park is the PETA KEHATIDA model, which is compiled based on the flora and fauna management sub-system, the visitor management sub-system, the local community management sub-system and the regional government institutional sub-system.

No : 15
Full name : Eneng Rahmi
Student Number : 250130120012
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 10-11-2016
Thesis Title : SCARCITY IN ABUNDANCE: POLITICAL ECOLOGY
PERSPECTIVE (Case study of springs water utilization in
Sukabumi Regency)

Thesis Abstract (English) :

Scarcity in the abundance is a common paradoxial phenomenon in developong countries. It indicates relative water scarcityconditions as a result of inequality access to watersources between the public and private sectors in one location. Here the public had difficulty access to the springs. On the other hand, private sector had access to the springs and able get some profit from it. Thus, the perspective of political ecology is used to obtain the factors that causing inequality access to the springs water. Political ecology shows that all forms of environmental changes with social conflict are not only caused by physical factors. It was influenced by political, economic, social and cultural. With mixed method, this research finds four dactors that causing of inequality access to water, such policy intervention related to water utilization by the incvestor; collaboration between state and private for determining allocation benefit of the springs; low public participation in determining patterns of water distribution and allocation; and acquisition of capital determines the access to water in the market mechanism. The alternative solution is needed to overcome these problems, such to make balance portion of utilizing water resources by increasing the water tax, technical rule should have the same vision with the main rule, count all of the environmental

impact related to water exploitation with economic valuation as a loop cycle, and give some attention to social impact related to some policy. The solution expected to create harmony in country's development so that all water users gain equal access to water and also to realize the environmental balance.

No : 16
Full name : Lili Mulyanta
Student Number : 250130150002
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 07-04-2022
Thesis Title : DOMESTIC RAW WATER SUPPLY MIX MODEL TO SUPPORT SUSTAINABLE DRINKING WATER SUPPLY SYSTEM IN BANDUNG CITY

Thesis Abstract (English) :

The typical condition that often occurs in several areas in Indonesia, especially in urban areas, related to the existence of water resources is a decrease in water availability while on the other hand, the need for water continues to increase from time to time, this is a logical consequence of the increase in population and increase in economic activity. The decrease in water availability and an increase in water demand also occurred in the city of Bandung. Changes in land use and poor in environmental management are thought to have resulted in a decrease in the availability of domestic raw water which greatly affects the fulfilment of domestic needs, especially in terms of quantity and continuity. One approach that can be taken to overcome the problem of raw water which greatly affects the fulfilment of domestic needs, especially in terms of quantity and continuity. One approach that can be taken to overcome the problem of raw water availability is the water demand management (WDM) approach. The WDM approach has the concept that an area can be either urban or rural and is a water reservoir. All water is accommodated, both rainwater and wastewater, i.e. domestic and non-domestic water, and industrial waste, then utilized as optimally as possible, the residue is released through the sewer. To apply the WDM concept, another approach is needed, namely the mix of domestic raw water. The purpose of this study is to obtain a domestic raw water supply model with a mixed water paradigm using a water demand management approach as part of water conservation that supports a sustainable drinking water supply system in the city of Bandung. To achieve this goal, several studies were carried out i.e., (1) analysis of the level of sustainability of domestic raw water supply in Bandung City; (2) designing domestic raw water supply models; (3) analysis of the economic value of water; and (4) create policy scenarios. The method of analysing the level of sustainability of domestic raw water supply uses the multidimensional scaling (MDS) method, Monte Carlo analysis, and prospective analysis. The domestic raw water supply model uses system dynamics through the Vensim PLE software. Analysis of the economic value of water using the Willingness to Pay (WTP) method, and making policy scenarios with simulations. The results showed that: (a) in a multidimensional approach, the supply of raw water for domestic water in Bandung City is less sustainable (43%); (b) the system dynamics model is able to explain the contribution of the mixed raw water supply from existing resources, rainwater harvesting, and domestic wastewater

recycling in the provision of sufficient water in the future, namely through water savings from the substitution of water use with individual rainwater harvesting and recycling of household greywater, as well as an additional supply of raw water from domestic WWTPs and retention ponds; (c) water is a basic need of the community that cannot be replaced, because based on the WTP analysis, the community that cannot be replaced, because based on the WTP analysis, the community feels they are able to pay for water services above the application tariff. Policy directions based on the simulation results include: integration between spatial planning and governance, adequate funding allocation for water supply system development, increasing public awareness and participation, cultural approaches, and local wisdom as strategy to increase community participation, development of drainage infrastructure that is environmental friendly and domestic wastewater management infrastructure, and improvement of coordination patterns between sectors, government, and other stakeholders with a collaborative governance approach. The results of this study indicate that the raw water supply is able to increase the availability of raw water so as to extend water security in the city of Bandung, therefore the government is expected to intervene in the application of the mixed domestic raw water supply, both from the aspect of financing and in the implementation of programs and activities.

No : 17
Full name : Yuniarti. MS
Student Number : 250130120011
Study Program : Environmental Science Doctoral Study Program
Graduation Year : 03-10-2017
Thesis Title : IMPLICATION OF THE SEGARA ANAKAN LAGOON
SEDIMENTATION ON MACROZOOBENTHOS COMMUNITY
STRUCTURE IN DIFFERENT SEASON

Thesis Abstract (English) :

Change of structure community of Macrozoobenthos due to sedimentation has apparently contributed to a reduction of the quality of aquatic environment particularly in Segara Anakan Lagoon. This study aims to determine the extent to which the effects of sedimentation, nutrients and different season in the Segara Anakan Lagoon on macrozoobenthos community structure. The method used in this study is survey. Primary data collected are nutrients, macrozoobenthos, sedimentation rate and secondary data. The results showed that the rate of sedimentation in dry and rainy season were 0.067 to 2.00 m/s and 1.61 to 2.00 m/s respectively. The highest of deposited sediment were 3.85×10^{-11} kg/m²/s in dry season and 3.14×10^{-6} kg/m²/s in rainy season. Nutrient of pore water in dry season ranged from 0.026-0.247 mg/L for PO₄, 0.109-0.624 mg/L for NH₃-N, 0.122-0.437 mg/L for NO₃-N, 0.008-0.33 mg/L for NO₂-N, 0.345-3.502 mg/L for N Total, 11.0-22.2 mg/L for TOC. The rainy season of nutrient value of pore water ranges from 0.030-0.374 mg/L for PO₄, 0.0586-0.1130 mg/L for NH₃-N, 0.306-2.47 mg/L for NO₃-N, 0.018-0.025 mg/L for NO₂-N, 0.704-3.116 mg/L for N Total, 7.07-8.14 mg/L for TOC. Index diversity of macrozoobenthos in dry and rainy season were 1.31 to 1.86 and 0 to 1.31 respectively. *Balanus* sp., *Melanoides* sp., *Corbicula* sp., *Polychaeta* sp., *Thiara* sp., were dominance in dry season, while *Corbicula* sp.,

Melanoides sp., *Thiara* sp., *Tarebra* sp., *Balanus* sp., *Polychaeta* sp., and *Barbatia* sp. were dominance in rainy season.